

CLAIMS

1. A columnar vessel pollution control device comprising:

- a. a tank having an interior portion, a lower end, an upper end, an inlet port, and an outlet port, said inlet port configured to receive an exhaust gas from a production source;
- b. a liquid solution, said liquid solution contained within said interior portion of said tank to form a column, said liquid solution having a composition selected to remove contaminants from said exhaust gas;
- c. a diffuser located within the lower end of said interior portion of said tank, said diffuser positioned to receive said plurality of exhaust gas from said inlet port, said diffuser at least partially immersed in said liquid solution, said diffuser configured to break down said exhaust gas into a plurality of small gas bubbles; and
- d. a mist assembly operably connected to said interior portion of said tank; said mist assembly including at least one nozzle, said at least one nozzle configured to spray said plurality of exhaust gas with a mist of said liquid solution within said interior portion as said small gas bubbles rise from said column of said solution.

2. The invention of claim 1 wherein said tank further includes a hatch in proximity to the lower end of said tank, said hatch configured to allow at least a portion of said column of solution to drain from said interior portion of said tank.

3. The invention of claim 1 wherein said tank further includes an inspection port, said inspection port configured to provide a point of access for maintenance or observation of said interior of said tank.

4. The invention of claim 1 wherein said solution is comprised of a brine solution.

5. The invention of claim 1 wherein said solution is comprised of a brine solution and caustic soda.

6. The invention of claim 1 wherein said solution includes Calcium Hydroxide Calcium Carbonate, or Sodium Bicarbonate.
7. The invention of claim 1 wherein said solution includes a plurality of aeration balls suspended within said solution.
8. The invention of claim 1 wherein said tank and said solution are configured to retain at least a portion of said plurality of small gas bubbles passing through said column of solution for approximately 4 to 10 seconds.
9. The invention of claim 1 further including a cooling unit, said cooling unit configured to cool at least a portion of said column of solution, said cooling unit operably connected to said tank to allow at least a portion of said column of solution to flow out from said tank, through said cooling unit, and back into said tank.
10. A columnar vessel pollution control device comprising:
 - a. a tank having an interior portion, a lower end, an upper end, an inlet port, and an outlet port, said inlet port configured to receive an exhaust gas from a production source;
 - b. a liquid solution, said liquid solution contained within said interior portion of said tank to form a column, said liquid solution having a composition selected to remove contaminants from said exhaust gas;
 - c. a diffuser located within the lower end of said interior portion of said tank, said diffuser positioned to receive said plurality of exhaust gas from said inlet port, said diffuser at least partially immersed in said liquid solution, said diffuser configured to break down said exhaust gas into a plurality of small gas bubbles;
 - d. a mist assembly operably connected to said interior portion of said tank; said mist assembly including at least one nozzle, said at least one nozzle configured to spray said plurality of exhaust gas with a mist of said liquid solution within said interior portion as said small gas bubbles rise from said column of said solution; and

- e. a cooling unit, said cooling unit configured to cool at least a portion of said column of solution, said cooling unit operably connected to said tank to allow at least a portion of said column of solution to flow out from said tank, through said cooling unit, and back into said tank.
- 11. The invention of claim 10 wherein said tank further includes a hatch in proximity to the lower end of said tank, said hatch configured to allow at least a portion of said column of solution to drain from said interior portion of said tank.
 - 12. The invention of claim 10 wherein said tank further includes an inspection port, said inspection port configured to provide a point of access for maintenance or observation of said interior of said tank.
 - 13. The invention of claim 10 wherein said solution is comprised of a brine solution.
 - 14. The invention of claim 10 wherein said solution is comprised of a brine solution and caustic soda.
 - 15. The invention of claim 10 wherein said solution includes Calcium Hydroxide Calcium Carbonate, or Sodium Bicarbonate.
 - 16. The invention of claim 10 wherein said solution includes a plurality of aeration balls suspended within said solution.
 - 17. The invention of claim 10 wherein said tank and said solution are configured to retain at least a portion of said plurality of small gas bubbles passing through said column of solution for approximately 4 to 10 seconds.